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ABSTRACT

Controversy exists regarding the nature of the creative process and strategies which hold maximum promise for accelerating creative production. This paper provides a structural overview of the major problems and issues found in the scientific study of creativity, primarily in regard to dimensionality and criterion choice. (KS)

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PROBLEMS AND ISSUES IN THE MEASUREMENT OF CREATIVITY[1]

by

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Introduction

Although a massive number of studies dealing with various aspects of creativity have been reported in the professional literature during the past two decades, a great deal of controversy still exists regarding the nature of the creative process and the strategies that hold maximum promise for accelerating creative production. While such controversy is optimistically viewed as the healthy symptom of any relatively new line of scientific inquiry, our failure to master certain basic problems after nearly 20 years of intensified study has led to a decrease in interest on the part of educational practitioners who at one time were eager to rally round the flag of creativity and to "do something" about this newly discovered (or rediscovered) human ability. Unless researchers can begin to come up with some answers to the many unsolved problems that have eluded us thus far, the concept of creativity will continue to be a catchall at best, and at worst, it may be in a very real danger of being tossed upon the junk heap of discarded educational fads.

The purpose of this paper is to provide a structural overview of the major problems and issues that are found in the scientific study of creativity. By isolating and pointing out the main dimensions of these problems, it is hoped that some direction will be given to future research efforts in this area; and although the paper will include several of the usual impassioned pleas for more research, I hope that the pleas will suggest areas of study that hold genuine promise for advancing our understanding of the creative process.

[1]Paper presented at the Annual Meeting of the American Educational Research Association, Minneapolis, Minnesota, March, 1970. Symposium, "Assessing Creativity: Progress in Both Directions," Richard E. Ripple, Chairman.

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The remarks that follow are predicated upon two basic underlying assumptions. The first is somewhat of an affirmation of faith in the belief that relatively unique psychological processes summarily referred to as creativity do in fact exist in man's repertoire of behaviors. Although we have only scratched the surface in the scientific study of these behaviors, there is a great deal of precedent in the history of science for concern with physical or psychological effects that appear to exist in the absence of the theoretical formulations or empirical verifications of the causes that lead to such effects. The second underlying assumption holds that the creative processes are multidimensional in nature and that these processes may differ to such a degree that we must treat verbal creativity and creativity in problem solving as completely different psychological processed from creativity in the arts. (This may be a far more useful distinction for the researcher than the creativity-intelligence distinction.) The discussion that follows in both this paper and the symposium in general will be primarily concerned with creative thinking processes rather than the creative processes in the arts.

The Dimensionality Issue

The single most controversial issue in the study of creativity and the issue that has perhaps prevented us from achieving some closure in programming for the classroom continues to be the many-faceted problem if dimensionality. The concern for this problem is reflected in the disproportionate amount of research that has been devoted to the creativity-intelligence distinction and our inability to arrive upon a generally acceptable operational definition. (Taylor, 1959, has listed over 100 definitions which have added to the semantic fog that envelopes the study of creativity.) A great deal of the concern for the dimensionality issue, and the lack of resolution of this issue is imbedded in the problem of measurement and the adequacy of currently available tests of creativity and the divergent thinking processes.

A number of research studies (Thorndike, 1963a, 1963b; Wallach and Kogan, 1965; and Ripple and May, 1962) have cautioned us against the uncritical acceptance of the Getzels and Jackson (1962) hypothesis which maintained that creativity and intelligence were antithetical concepts; and in a historical perspective upon the measurement of cognitive processes, Ward (1963) has called attention to aspects of Binet's and Wechsler's classic definitions of intelligence, parts of which sound surprisingly similar to present day definitions of creativity. Others (Wallach, in press) have made a similar case for the relationship between creativity and the classic definitions of problem solving.

Simply stated, the dimensionality issue involves the degree to which measures of creativity or divergent thinking are empirically distinguishable from other more traditional measures of cognitive process such as intelligence and academic achievement. The development of defensible measures of creativity would therefore seem to depend on constructing a series of divergent thinking tasks which share substantial variance with each other, but that are at the same time maximally orthogonal from the traditional cognitive measures. The studies cited above by Thorndike, Wallach and Kogan, and Ripple and May indicate that when certain methodological problems such as subject representativeness are controlled, tests of the Guilford and Torrance type do not seem to meet these requirements. And although a more promising distinction has been reported for the associative type of creativity measure, at least one study (Cropley, 1966) suggests that Mednick's Remote Associates Test is more related to conventional verbal skills than to divergent thinking abilities. The more recent tests developed by Wallach and Kogan (1965) appear to be meeting some of the above requirements of maximum orthogonality, and at least two aspects of their research offer promising leads for would-be authors of creativity measures.

The first suggestion is related to Mednick's (1962) associative gradient hypothesis which implies a positive relationship between the production of unique associates and the number of responses generated by a given stimulus. Mednick also offers support for the conclusion that early responses tend to be the more common ones in terms of statistical rarity; and that persons who produce a larger number of responses are more likely to achieve uniqueness in their latter rather than earlier responses. In other words, Mednick proposes a gently sloping curve rather than a steep gradient. Some recent research studies (Clark and Mirels, 1969; Mednick, 1962, Paulus, 1970; Archambault, 1970), including two that will be reported here today, have found that fluency, as measured by a simple frequency count of relevant responses may well be the single most important contributor to the variance of creativity as measured by instruments such as the Torrance tests. The question here is, of course, whether or not this is a characteristic of the psychological process of creativity, the nature of the instruments that we are currently using to assess creativity, or the result of an interactive effect between the two. If fluency is, in fact, a necessary condition for uniqueness or originality, then at least two very important suggestions emerge for the researcher. We must first of all find ways of "squeezing" as many responses as possible out of the person being tested; and secondly, we must allow sufficient time for the individual to work to the point of extinction.

The second promising lead offered by Wallach and Kogan deals with the amount of threat or stress that is generated in testing situations. Stress manipulation studies by these and other investigators (Reece and Whitman, 1962; Dentler and Mackler, 1964; and Wild, 1965) indicate that both the number and unusualness of responses increases under conditions where a friendly and supportive atmosphere is created and where the issue of personal success versus failure is minimized.

Although we can readily see the importance of both the time and stress factors in assessing creativity, somewhat of a practical dilemma occurs when we contrast the above mentioned need for squeezing the maximum number of responses from the individual with the equally important need for keeping stress-producing administrative procedures at an absolute minimum. With practical considerations such as testing time and costs always in the backs of our minds, this dilemma presents the researcher with a formidable challenge, but one that I am sure can be solved if we exercise a little creativity!

Some of the research related to the dimensionality issue has called attention to an empirically observed distinction between types of fluency factors, and this distinction suggests another promising area of focus for further study. Thorndike (1963b) has pointed out that although measures of word fluency correlated twice as high with measures of convergent thinking than with those of divergent thinking, ideational and associational fluency factors correlate more strongly among themselves than they do with convergent thinking. And Wallach (in press) has pointed out that when the effects of intelligence are partialled out of measures in the divergent thinking domain, a "cognitive disposition remains that seems most adequately characterized as ideational fluency" (p. 26). These studies lend strong support to the existence of a relatively distinct ideational fluency factor; and thus, the construction and refinement of assessment tasks that might tap this factor would appear to be a highly valuable line of research endeavor.

The Criterion Problem

A major problem area within the study of creativity is concerned with the external validation of measuring instruments. Although the criterion problem, as applied to creativity measurement, has not generated as much "heat" as the creativity-intelligence controversy, its interrelatedness to all other aspects of the study of creativity probably causes it to be the number

one priority area for needed research. The scope of this problem makes it difficult to do little more than point out current deficiencies and call attention to the main dimensions of necessary and potentially fruitful areas of study.

Foremost among the failures to establish external criteria have been attempts to use teacher and peer judgments as a means of identifying creative youngsters. A number of studies which sought to use this approach (Holland, 1959; Wallen and Stevenson, 1960; Rivlin, 1959; Reid, King, and Wickwire, 1959; Torrance, 1966; and Yamamoto, 1964) have generally shown that when teachers and peers are asked to nominate students or classmates with good imaginations, new ideas, new ways of doing things, etc., they usually produce a list of persons who are the highest achievers as measured by traditional criteria. What seems to be needed by way of research if this is indeed a viable approach, is a method for eliminating the halo effect that appears to be contaminating the nomination process.

A related attempt to establish external criteria for creativity has been the well-known series of studies that analyzed the characteristics of adults who have made significant contributions to their respective professions (e.g., MacKinnon's (1962) study of exceptionally creative architects). While these studies have provided us with excellent profiles and descriptions of the creative person, we must be careful not to confuse concurrent validity with predictive validity. MacKinnon has cautioned that it is one thing to discover distinguishing characteristics, but quite another matter to conclude that traits observed several years after school or college truly characterized an individual when he was a student. Nor can we conclude that these same traits in youngsters today will identify individuals with the kind of creative potential that will be valued in tommorrow's world. This problem is of course related to the larger issue of the temporal and cultural relativity of crea-

tivity. In the paper by Davis (1970), we will see a specific example of how the culture bound nature of creativity may present the researcher with yet another hardship in trying to master the criterion problem.

A final dimension of the criterion problem (as far as this discussion is concerned) deals with the appropriateness or inappropriateness of our current means for assessing originality. While a few have dissented, almost everyone who has grappled with creativity research appears to be satisfied with the statistical infrequency criterion for measures of originality. At least one researcher (Starkweather, 1964) has attempted to devise an alternate means for evaluating originality, and I cannot help but wonder if our comfort with the statistical infrequency criterion has prevented us from seeking new methods for measuring this dimension of creativity.

Time does not permit an exhaustive treatment of the many obvious and subtle ramifications of the criterion problem, but I would be remiss if I did not at least mention such important issues as assessing the relevance of responses; distinguishing between sensible and bizarre responses; and establishing differential age and sex criteria. All of these issues have been treated with varying degrees of sophistication in the literature, but most would agree that they are essentially unresolved problems, and thus appear to be topics that are worthy of the researcher's attention. Additional problems dealing with creative problem solving will be pointed out in the paper by Treffinger (1970).

Summary

By way of summary, an attempt has been made to point out some of the major problems or "big" issues that are encountered in the measurement of creativity. Although some progress is no doubt being made, I believe that a great deal of rigorous research lies ahead if we are going to shed any noticeable light on this sometimes shadowy and often illusive concept. One

of my colleagues recently described the study of creativity as a classic case of the blind leading the blind, but I prefer to think that researchers in this area should look upon the situation as somewhat of a challenge and keep in mind that in the land of the blind the one eyed man is king!

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